

RHYACOPHILA KONDRATIEFFI
(TRICHOPTERA: RHYACOPHILIDAE), A NEW
SPECIES FROM VIRGINIA

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Abstract. — *Rhyacophila kondratieffi*, n. sp., is described from southwestern Virginia. The species lives in first and second order mountain streams.

An undescribed species of *Rhyacophila* was discovered among specimens of Trichoptera collected by Boris C. Kondratieff from Little Rock Castle Creek, a second order spring-fed stream in Patrick County, Virginia. Further collecting by Dr. Kondratieff in similar habitats in Grayson and Smyth counties resulted in additional specimens.

The new species is a member of the *invaria* subgroup of the *Rhyacophila invaria* group of species (Schmid, 1970). It is most closely related to *R. banksi* Ross, *R. parantra* Ross, and *R. shenandoahensis* Flint as evidenced in the males by the concave segment X, the elongate anal sclerites with small apical lobes and horizontally produced lateral winglets ("petites aillettes laterales horizontales," Schmid, 1970:61), the bilobed apical segment of the inferior appendages having the dorsal lobe approximately half the length of the ventral lobe, and the large phallic apparatus having spiniform parameres and prominent membranous ventral lobes. With the females of the *invaria* subgroup, the new species shares the ventral median process and dorsal notch of the posterior margin of segment VIII and simple vaginal sclerites with an elongate, curved terminal sclerite and reduced lateral sclerites.

***Rhyacophila kondratieffi* Parker, NEW SPECIES**

Adult. — Structure typical for genus. Color of specimens in alcohol brown. Forewing 7-9 mm in length. Sternum of abdominal segment VII with small median apical projection. *Male genitalia* (Fig. 1a-d): Segment IX (Fig. 1a) narrow ventrally with prominent longitudinal strengthening ridge at articulation with inferior appendage, abruptly widened above strengthening ridge; dorsal apical lobe (Fig. 1a) extending over body of segment X and anal sclerites, obscuring them in dorsal aspect (Fig. 1b), apical margin irregular, apex rounded to triangular. Body of segment X (Fig. 1a) large, concave, occupying concavity in segment IX between inferior appendage and dorsal apical lobe of segment IX, bearing prominent setae around outer margin and stouter setae on raised protuberances on posterior concave surface (Fig. 1c); anal sclerite sinuous in lateral aspect (Fig. 1a) with long basal portion extending into segment IX and having enlarged apical portion pro-

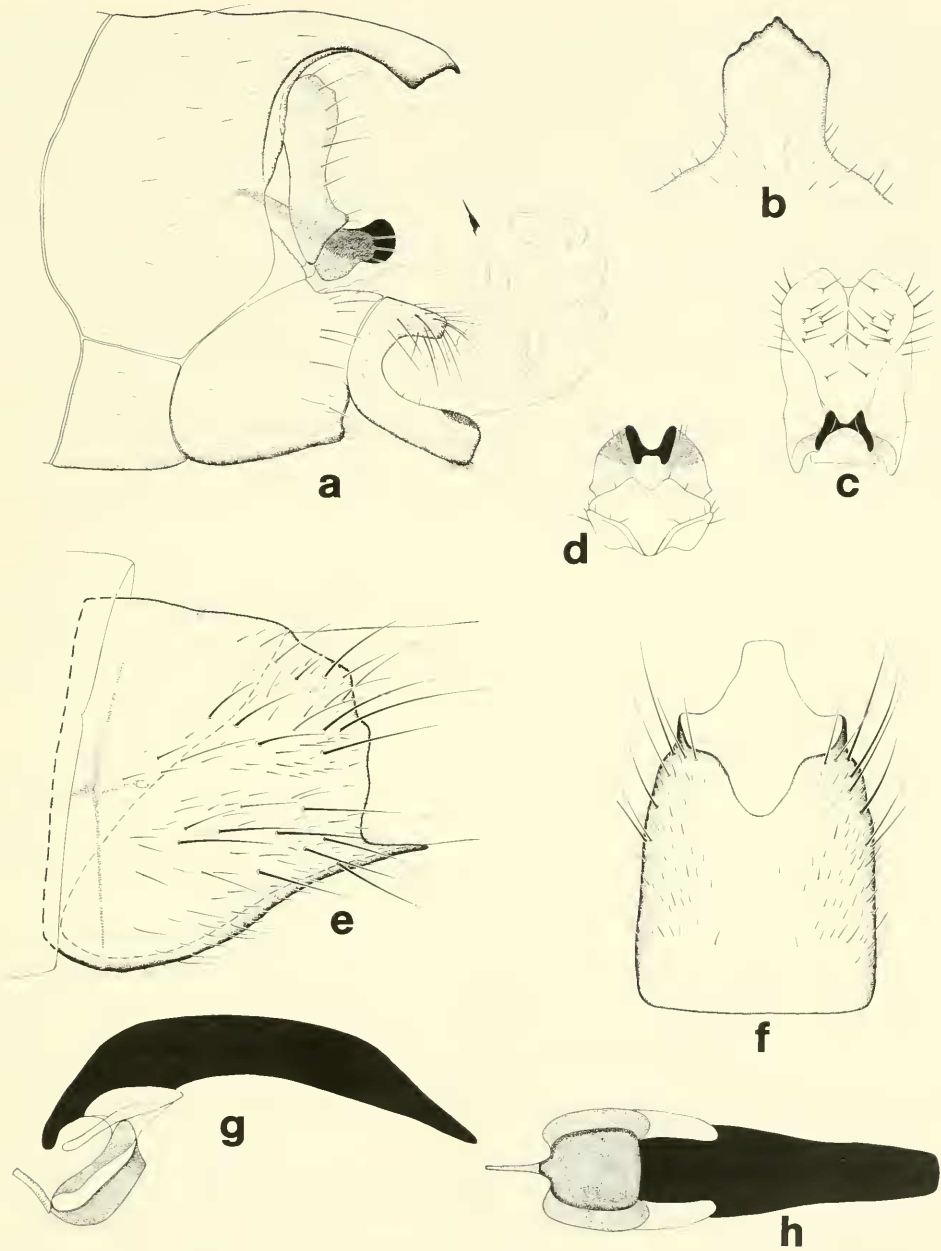


Fig. 1. *Rhyacophila kondratieffi* genitalia. a, Male, lateral. b, Male, dorsal apical lobe of segment IX, dorsal. c, Male, body of segment X and anal sclerites, caudal. d, Male, body of segment X and anal sclerites, dorsal. e, Female, segment VIII, lateral. f, Female, segment VIII, dorsal. g, Female, vaginal sclerites, lateral. h, Female, vaginal sclerites, ventral.

duced posteriorly into darkly sclerotized rounded lobe bearing numerous minute spicules, produced laterally into lightly sclerotized triangular projection; anal sclerite in dorsal aspect (Fig. 1d) with posterior apical lobes separated medially by broad U-shaped cleft. Inferior appendage (Fig. 1a) having basal segment quadrate, apical segment bilobed with dorsal lobe approximately one-half length of ventral lobe and bearing several long posteroventrally directed setae, ventral lobe bearing conspicuous patch of peg-like setae. Phallic apparatus (Fig. 1a) large, paramere membranous with spiniform apex, aedeagus lightly sclerotized. *Female genitalia* (Fig. 1e-h): Segment VIII with ventral median projection (Fig. 1f) truncate or emarginate apically, lateral margin (Fig. 1e) without prominent projections or emarginations, dorsal margin (Fig. 1f) with broad smooth U-shaped notch. Vaginal sclerites brown, terminal sclerite elongate, decurved in lateral aspect (Fig. 1g) and uniform in width throughout most of length with posterior third tapered to acute apex, in ventral aspect (Fig. 1h) broadest anteriorly and ending in truncate or slightly emarginate apex, lateral margins sinuous; lateral sclerites small and widely separated ventrally (Fig. 1h), connected to basal ring by cup-shaped median sclerite.

Types.—Holotype, ♂, VIRGINIA: Patrick County, Little Rock Castle Creek, Rt. 605 off Rt. 8, 13 May 1979, B.C. Kondratieff. Paratypes, VIRGINIA: same data as holotype, 32 ♂ and 10 ♀; same data, P. Firth (PF79-17-2), 2 ♂ and 4 ♀. Grayson County, Lewis Fork, Rt. 603, 30 May 1981, B.C. Kondratieff, 4 ♂. Smyth County, headwater springs of Grindstone Branch, Grindstone Cppgrd., Rt. 603, 30 May 1981, B.C. Kondratieff, 3 ♂; Grindstone Branch, Grindstone Cppgrd., 7 July 1980, B.C. Kondratieff, 2 ♂.

All specimens are deposited in the collection of the National Museum of Natural History.

Etymology.—This species is named in honor of Boris C. Kondratieff, a friend of the author, an outstanding entomologist, and an avid collector who has contributed much to the study of aquatic insects.

Diagnosis.—Males of *Rhyacophila kondratieffi* are easily distinguished from males of the other species in the *invaria* subgroup by the long undivided dorsal apical lobe of segment IX which extends posteriorly beyond the apex of segment X and the anal sclerites. The females are distinguished by having the ventral projection of segment VIII truncate or only slightly emarginate, and having the lateral margin simple rather than sinuous, incised, or bearing a sharp tooth, and by the shape of the vaginal apparatus.

Remarks.—There is considerable morphological variation within all of the species in this subgroup. Males of *kondratieffi* are no exception, particularly in the shape of the dorsal apical lobe of segment IX and the apical segment of the inferior appendages. Specimens from Smyth County tend to have a less angular, more rounded outline to the dorsal apical lobe than specimens from Patrick County. Specimens from Grayson County are similar to those from Smyth County, except that the dorsal apical lobe is more irregular. Specimens from both Smyth and Grayson counties, as well as some specimens from Patrick County have the apex of the dorsal lobe of the apical segment of the inferior appendage acute or rounded. Specimens from these localities also have the apex of the ventral lobe rounded rather than truncate as in the holotype (Fig. 1a) and many other specimens from Patrick County.

The phylogenetic relationships of *kondratieffi*, *banksi*, *parantra*, and *shenandoahensis* are difficult to determine. The fact that all four species occur in isolated populations in small spring-fed streams has resulted in their being infrequently encountered by most collectors and thus not well represented in collections. Schmid (1970) treats *banksi*, *parantra*, and *shenandoahensis* as an unresolved trichotomy. According to Schmid, a prominent undivided dorsal apical lobe of segment IX represents the ancestral condition within *Rhyacophila*. On the other hand, Ross (1956) apparently considers the absence of a dorsal apical lobe to represent the ancestral condition in *Rhyacophila*. There is insufficient information available about other characters to resolve the question of the relationships of the species of the *invaria* subgroup.

LITERATURE CITED

- Ross, H. H. 1956. The evolution and classification of the Mountain Caddisflies. University of Illinois Press, Urbana, Illinois. 213 pp.
- Schmid, F. 1970. Le genre *Rhyacophila* et la famille des Rhyacophilidae (Trichoptera). Mémoires de la Société Entomologique du Canada 60: 1-230.